

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Amended) A system for suppressing interference in a communication of data channels across a common communication medium and the system for suppressing interference comprising:

a ~~first remote~~ set of modems coupled to a remote end of the common communication medium ~~for transport and reception of corresponding data channels there through;~~

a ~~second local~~ set of modems coupled to a local end of the common communication medium ~~for transport and reception of corresponding data channels there through;~~ and

an interference canceller coupled with the ~~second local~~ set of modems and configured to coordinate during a training phase, transmissions of selected interfering data channels of at least the first remote set of modems and the second set of modems with reception of at least one selected victim data channel at a corresponding one of the ~~second local~~ set of modems and to adaptively derive at least far end crosstalk (FEXT) interference cancellation coefficients between each the at least one victim data channel and each the selected interfering data channels and to apply the ~~derived~~ interference cancellation coefficients during a runtime phase to digitized samples of the data channels communications received by each the corresponding one of the second local set of modems to substantially cancel at least FEXT interference therein in the digitized samples.

2. (Currently Amended) The system for suppressing interference of Claim 1 4, wherein said interference canceller adaptively derives ~~both FEXT and NEXT~~ interference cancellation coefficients for each victim data channel.

3. (Currently Amended) The system for suppressing interference of Claim 2 4, wherein said interference canceller adaptively derives self-NEXT interference cancellation coefficients to substantially cancel an echo interference on each of the victim data channels.

4. (Currently Amended) ~~The A~~ system for suppressing interference ~~of Claim 1,~~ in a communication of data channels across a common communication medium and the system for suppressing interference comprising:

a first set of modems coupled to the common communication medium for transport and reception of corresponding data channels there through;

a second set of modems coupled to the common communication medium for transport and reception of corresponding data channels there through; and

an interference canceller coupled with the second set of modems and configured to coordinate during a training phase transmissions of selected interfering data channels of the first set of modems and the second set of modems with reception of a selected victim channel at a corresponding one of the second set of modems and to adaptively derive interference cancellation coefficients between each victim data channel and each interfering data channel wherein said interference canceller by ~~combines~~ combining a selected training sequence with digitized samples received by a selected one of the second set of modems each victim data channel and resulting from a transmission of the selected training sequence by a corresponding one of the first set of modems, to adaptively derive interference cancellation coefficients which correspond with the spectral characteristics of the selected data channel between the selected one of the second set of modems and the corresponding one of the first set of modems- and to apply the derived interference cancellation coefficients during a runtime phase to digitized samples of the data channels received by each of the second set of modems to substantially cancel interference in the digitized samples.

5. (Currently Amended) The A system for suppressing interference of Claim 1, wherein ~~said interference canceller further comprises:~~ in a communication of data channels across a common communication medium and the system for suppressing interference comprising:

a first set of modems coupled to the common communication medium for transport and reception of corresponding data channels there through;

a second set of modems coupled to the common communication medium for transport and reception of corresponding data channels there through; and

an interference canceller coupled with the second set of modems and configured to coordinate during a training phase transmissions of selected interfering data channels of the first set of modems and the second set of modems with reception of a selected victim channel at a corresponding one of the second set of modems and to adaptively derive interference cancellation coefficients between each victim data channel and each interfering data channel and to apply the derived interference cancellation coefficients during a runtime phase to digitized samples of the data channels received by each of the second set of modems to substantially cancel interference in the digitized samples, and the interference canceller including:

banks of adaptive filters corresponding in number with a number of modems within said second set of modems and with each bank coupled to a selected one of the second set of modems and with the number of adaptive filters in each bank less in number than the number of modems; and

a switch fabric for selectively coupling filters within each bank with selected interfering data channels of the first set of modems and the second set of modems on the basis of relative magnitudes of the interference cancellation coefficients for each of the interfering data channels.

6. (Currently Amended) The A system for suppressing interference of ~~Claim 1~~, wherein ~~said interference canceller further comprises:~~ in a communication of data channels across a common communication medium and the system for suppressing interference comprising:

a first set of modems coupled to the common communication medium for transport and reception of corresponding data channels there through;

a second set of modems coupled to the common communication medium for transport and reception of corresponding data channels there through; and

an interference canceller coupled with the second set of modems and configured to coordinate during a training phase transmissions of selected interfering data channels of the first set of modems and the second set of modems with reception of a selected victim channel at a corresponding one of the second set of modems and to adaptively derive interference cancellation coefficients between each victim data channel and each interfering data channel and to apply the derived interference cancellation coefficients during a runtime phase to digitized samples of the data channels received by each of the second set of modems to substantially cancel interference in the digitized samples, and the interference canceller including:

banks of adaptive filters corresponding in number with a number of modems within said second set of modems and with each bank coupled to a selected one of the second set of modems and with the number of adaptive filters in each bank less in number than the number of modems;

an interpolator/decimator coupled to said bank of adaptive filters to decrease and increase a number of digitized samples for each of said received signals to correspond with relative bandwidths of each of the corresponding data channels.

7. (Currently Amended) The system for suppressing interference of Claim ~~1~~ 4, wherein further said first set of modems and said second set of modems are each logical modems

established by sharing signal processing power of a digital signal processor among multiple data channels.

8. (Currently Amended) The system for suppressing interference of Claim ~~1~~ 4, wherein further the common communication medium comprises a wireless medium.

9. (Currently Amended) The system for suppressing interference of Claim ~~1~~ 4, wherein further the common communication medium comprises a binder of subscriber lines.

10. (Currently Amended) The system for suppressing interference of Claim ~~1~~ 4, wherein further said data channels include data modulated in at least one X-DSL protocol.

11. (Currently Amended) The system for suppressing interference of Claim ~~1~~ 10, wherein further ~~said the~~ at least one X-DSL protocol includes G.Lite, ADSL, VDSL, SDSL, MDSL, RADSL, and HDSL.

12. (Currently Amended) The system for suppressing interference of Claim ~~1~~ 10, wherein further ~~said the~~ at least one X-DSL protocol includes at least one of a discrete multi-tone (DMT) line code and carrier less AM/PM (CAP) line code.

13. (Canceled)

14. (Currently Amended) The apparatus for suppressing interference of Claim ~~13~~ 16, wherein said interference canceller adaptively derives ~~both FEXT and NEXT~~ interference cancellation coefficients for each victim data channel.

15. (Currently Amended) The apparatus for suppressing interference of Claim ~~14~~ 16, wherein said interference canceller adaptively derives self-NEXT interference cancellation coefficients to substantially cancel an echo interference on each of the victim data channels.

16. (Currently Amended) ~~The~~ An apparatus for suppressing interference of Claim ~~13~~, in a communication of data channels across a common communication medium and the apparatus for suppressing interference comprising:

a plurality of analog front ends (AFE's) each coupled to common communication medium for transmission and reception of corresponding channels of data there through;

at least one digital signal processor (DSP) for processing the corresponding channels of data; and

an interference canceller coupled with the at least one DSP and configured to coordinate during a training phase transmissions of selected interfering data channels with reception of a selected victim channel at a corresponding one of the plurality of AFEs to adaptively derive interference cancellation coefficients between each victim data channel and each interfering data channel. ~~wherein said interference canceller combines~~ by combining a selected training sequence with digitized samples received by a selected one of the second set of modems and resulting from a transmission across the common communication medium of the selected training sequence via a selected data channel, to adaptively derive interference cancellation coefficients which correspond with the spectral characteristics of the selected data channel. and to apply the derived interference cancellation coefficients during a runtime phase to

digitized samples of the data channels received by each corresponding one of the plurality of AFEs to substantially cancel interference in the digitized samples.

17. (Currently Amended) ~~The~~ An apparatus for suppressing interference ~~of Claim 13;~~
~~wherein said interference canceller further comprises:~~ in a communication of data channels
across a common communication medium and the apparatus for suppressing interference
comprising:

a plurality of analog front ends (AFE's) each coupled to common communication
medium for transmission and reception of corresponding channels of data there through;

at least one digital signal processor (DSP) for processing the corresponding channels
of data; and

an interference canceller coupled with the at least one DSP and configured to
coordinate during a training phase transmissions of selected interfering data channels with
reception of a selected victim channel at a corresponding one of the plurality of AFEs to
adaptively derive interference cancellation coefficients between each victim data channel and
each interfering data channel and to apply the derived interference cancellation coefficients
during a runtime phase to digitized samples of the data channels received by each
corresponding one of the plurality of AFEs to substantially cancel interference in the
digitized samples and the interference canceller including:

banks of adaptive filters corresponding in number with a number of said AFEs and
with each bank coupled to a selected one of said AFEs and said DSP and with the number of
adaptive filters in each bank less in number than the number of modems; and

a switch fabric for selectively coupling filters within each bank with selected
interfering data channels transmitted and received by said AFE's on the basis of relative
magnitudes of the interference cancellation coefficients for each of the interfering data
channels.

18. (Currently Amended) ~~The~~ An apparatus for suppressing interference ~~of Claim 13,~~
~~wherein said interference canceller further comprises:~~ in a communication of data channels
across a common communication medium and the apparatus for suppressing interference
comprising:

a plurality of analog front ends (AFE's) each coupled to common communication
medium for transmission and reception of corresponding channels of data there through:

at least one digital signal processor (DSP) for processing the corresponding channels
of data; and

an interference canceller coupled with the at least one DSP and configured to coordinate
during a training phase transmissions of selected interfering data channels with reception of a
selected victim channel at a corresponding one of the plurality of AFEs to adaptively derive
interference cancellation coefficients between each victim data channel and each interfering
data channel and to apply the derived interference cancellation coefficients during a runtime
phase to digitized samples of the data channels received by each corresponding one of the
plurality of AFEs to substantially cancel interference in the digitized samples and the
interference canceller including:

banks of adaptive filters corresponding in number with a number of AFEs and with
each bank coupled to a selected one of the AFEs and the DSP and with the number of
adaptive filters in each bank less in number than the number of modems;

an interpolator/decimator coupled to said bank of adaptive filters to decrease and
increase a number of digitized samples for each of said received signals to correspond with
relative bandwidths of each of the corresponding data channels.

19. (Canceled)

20. (Currently Amended) The apparatus for suppressing interference of Claim ~~13~~ 16, wherein further the common communication medium comprises a wireless medium.

21. (Currently Amended) The apparatus for suppressing interference of Claim ~~13~~ 16, wherein further the common communication medium comprises a binder of subscriber lines.

22. (Currently Amended) The apparatus for suppressing interference of Claim ~~13~~ 16, wherein further said the data channels include data modulated in at least one X-DSL protocol.

23. (Currently Amended) The apparatus for suppressing interference of Claim ~~13~~ 22, wherein further said at least one X-DSL protocol includes G.Lite, ADSL, VDSL, SDSL, MDSL, RADSL, and HDSL.

24. (Currently Amended) The apparatus for suppressing interference of Claim ~~13~~ 22, wherein further said the at least one X-DSL protocol includes at least one of a discrete multi-tone (DMT) line code and carrier less AM/PM (CAP) line code.

25. (Previously Presented) A method for suppressing interference in a communication of data channels across a common communication medium and the system for suppressing interference comprising the acts of:

adaptively filtering selected transmitted interfering data channels with at least one selected received data channel to determine during a training phase interference cancellation coefficients there between;

selecting for each received data channel at least one significant interfering data channel among the transmitted data channels based on said interference cancellation coefficients determined in said act of adaptively filtering; and

exclusively applying during a runtime phase the interference cancellation coefficients associated with the at least one significant interfering data channel selected in said selecting act to digitized samples of each corresponding received data channel to substantially cancel interference in the digitized samples.

26. (Previously Presented) The method for suppressing interference of Claim 25, further comprising the act of:

varying a number of the digitized samples to correspond with a bandwidth of the corresponding received data channel.

27. (Previously Presented) The method for suppressing interference of Claim 25, wherein the adaptively filtering act further comprises the act of:

training the at least one selected received data channel concurrently with all interfering data channels.

28. (Previously Presented) The method for suppressing interference of Claim 25, wherein the at least one selected received data channel includes all received data channels and the adaptively filtering act further comprises the act of:

training all of the received data channels with a selected one of the interfering data channels.